

total irradiated volume and percent lung receiving 20 Gy (V20) for the 2 plans were compared.

Results: Incorporation of PET data into planning resulted in 1.2-5.5 increase in GTV for 11 patients, and 0.5 decrease for 1 patient, allowing differentiation between tumor and atelectasis. Unsuspected mediastinal disease was identified in 4(30%). Radiation ports were altered to provide more adequate coverage of the bioanatomic tumor volume in 8 patients. Despite the mean GTV was 2.8 times greater using PET, average increases in total volume irradiated and V20 were only 30% and 20%. Radiation ports were not changed in 2 patients, and were reduced in 2 patients resulting in 17 to 34% decrease in volume irradiated and V20.

Conclusions: Co-registration of PET with planning CT images provides a bioanatomic target that improves delineation of the tumor by better defining extent of local disease and including positive lymph nodes that may not be apparent using CT alone. Incorporation of PET images into treatment planning reduces the likelihood of geographical misses, which may result in improved local control and survival. This information can further assist 3D treatment planning to customize conformal fields so a greater extent of disease can be treated while minimizing the total volume irradiated and V20, and reducing the risk of toxicity.

960

POSTER DISCUSSION

Target volume definition in non-small cell lung cancer using 3-dimensional image registration of pre- and post-chemotherapy CT scans

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Aim: Inter-clinician variations in delineating target volumes are a source of systematic errors in radiotherapy treatment planning (RTP). We compared the results of visual transfer of contours to RTP scans with transfer after 3D image registration, in patients receiving induction chemotherapy for non-small cell lung cancer (NSCLC).

Materials and methods: Pre-chemotherapy diagnostic CT scans (on a curved couch-top) and RTP scans (hard couch-top and arm-rest) were performed in 5 patients who received induction chemotherapy, followed by 'involved-field' radiotherapy. A second RTP scan was performed after chemotherapy, and pre-chemotherapy gross tumor volumes (GTV) were reconstructed at an ACQSIMT workstation by 3 clinicians in the following manner: (i) a 'GTV-visual' generated while viewing the hard copies of the diagnostic CT scan, (ii) a 'GTV-match' after on-screen registration of pre- and post-chemotherapy RTP scans and (iii) GTV's after registration of the pre-treatment diagnostic CT scans with the post-chemotherapy RTP scan. Image registration was performed using the contoured body of a thoracic vertebra adjacent to the tumor. The 'GTV-match' was used for the actual treatment planning. Data were analysed using Cadplan and reproducibility of the contoured GTV's was defined by the ratios of common areas of overlap for the respective contours.

Results: The best method of image registration, as assessed both by clinicians and by ACQSIMT software was achieved using pre-chemotherapy RTP scans. GTV's derived with 3D image registration were almost invariably larger than those derived using visual contouring ($57.4 \pm 10\%$ versus $70.8 \pm 7\%$, mean $\pm 1SD$). Similarly, the mean reproducibility of contouring per patient improved from $61 \pm 15.6\%$ to $71.7 \pm 9.4\%$ with 3D registration.

Conclusions: 3D image registration of pre- and post-chemotherapy RTP scans resulted in the generation of larger, and more reproducible, GTV's than that derived using visual matching. This technique may be even more important for highly chemosensitive tumors such as small cell lung cancer. The resulting improvement in target volume coverage is likely to improve local tumor control.

961

POSTER DISCUSSION

Preservation of salivary function by IMRT: importance of PTV-CTV margin

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Purpose: Xerostomia has a major impact on quality of life after radiotherapy for head and neck tumours. We investigated to what extent the size of the margin between CTV (clinical target volume) and PTV (planning target volume) influences the prospects of modulating the intensity of the beam (IMRT) to preserve parotid gland function.

Methods: For definition of CTV we used a planning CT-scan in a patient treated with primary radiotherapy for oropharyngeal cancer (T2N0). We delineated the CTV for the primary tumour (gross target volume + 1 cm margin for microscopic disease) and the regional node levels II-IV bilaterally. We developed a class solution using IMRT (ITP, PLATO) inverse planning, with 7 beams and 15 intensity levels per beam. The NTCP (normal tissue complication probability) for <25% of the initial parotid gland function was calculated, using IMRT plans, with a margin between CTV and PTV in a range of 0-10 mm. NTCP values of parotid function were derived from our detailed parotid salivary flow measurements in 108 patients treated for head and neck malignancies.

Results: The NTCP for contralateral parotid function was <10% for a PTV-CTV margin of 6 mm or less, 25% for a margin of 8 mm, and 31% for a margin of 10 mm. The NTCP for ipsilateral parotid function was 20% for a margin of 4 mm or less, 31%, 38% and 65% for a margin of 6, 8, and 10 mm, resp.

Conclusion: The uncertainty margin between CTV and PTV, necessary for setup-errors and movement of the patient in the mould, is crucial for the prospects of IMRT to preserve parotid function. Measurements should be taken to keep the margin within 6 mm.

962

POSTER DISCUSSION

ESTRO/ASTRO consensus statement on the measurement of metastatic bone pain in radiotherapy trials

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Background: A total of 11 randomised phase III trials, each involving over 100 patients, have addressed the question of optimal fractionation for the treatment of metastatic bone pain. Review of these trials has shown wide variation in the methods used to measure bone pain. The impact of this is highlighted in the analysis of the Dutch bone pain trial reporting a complete response rate of 25% with a pain score of zero, 12% when analgesic use is included and only 4% if global quality of life is used. Across studies wide variation is also seen with the additional impact of differing patient populations.

Method: A consensus initiative was established under the auspices of ESTRO and ASTRO in July 2000 to evaluate the various endpoints used and establish a consensus position for definition of pain scoring in future trials of palliative radiotherapy. The first round of discussions held at ASTRO 2000 was based on a questionnaire completed by 35 prominent investigators in the field of metastatic bone pain.

Results: This showed that in some areas of pain assessment there was a clear majority consensus, for example in the use of patient rather than physician scores, the use of a 10 point categorical scale and the use of analgesics as at least a secondary end-point. Other areas identified wider variation and uncertainty, for example definition of partial response, the most appropriate pain to measure, analgesic scoring and impact of retreatment. A second round questionnaire is underway addressing more specific issues within these uncertain areas on the basis of which a consensus statement will be formulated for presentation and approval at the annual ESTRO and ASTRO meetings in Autumn 2001.

Gynaecological cancer

963

POSTER DISCUSSION

Retrospective study of the impact of taxol/platinum (TAX-P) vs non-taxol/platinum (NOTAX-P) chemotherapy on response and survival of patients with advanced ovarian cancer (AOC). Report from a single institution

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Objective: To evaluate if taxol-platinum chemotherapy has improved the outcome of patients (p) with AOC treated in a single institution.

Patients and Methods: Retrospective study. From 1986 to 2000, 190 pt with AOC received platinum-based chemotherapy (64.7% NOTAX-P, 35.3% TAX-P). Characteristics of the p were (NOTAX-P vs TAX-P): mean age: 56 vs 58 y, at least surgical biopsy: 85% vs 82%, FIGO III/IV stages: 79%/21% vs 77%/23%, residual disease >2 cm: 84% vs 80%, 2nd laparotomy: 42%